

Occupational diseases of farmers insured with the Agricultural Social Insurance Fund (KRUS)

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Abstract

The study deals with farmers' occupational diseases that are covered by the Agricultural Social Insurance Fund (KRUS). It presents the quantitative and territorial structure of the types of occupational diseases of farmers insured with KRUS between 2012 and 2021. The effects of occupational diseases for farmers, based on health impairment suffered, were also examined. The incidence of occupational diseases by age of insured farmers was reviewed. The role of the prevention activities undertaken by KRUS to reduce the incidence of occupational diseases among farmers was also presented. The study draws on KRUS data and information material as well as literature. Descriptive analysis, tabular analysis and inference methods were used to achieve the objectives and verify the hypotheses.

Keywords: Lyme disease, occupational diseases, farm, KRUS, work, insured farmer, health impairment.

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Introduction

Farmers' occupational diseases have a social, productivity/income and financial aspect. From a social perspective, they render the affected farmers unable to work. In turn, ill agricultural producers who are not working contribute to a reduction of the output of their farms. Finally, this leads to a decrease in farm income and income per farm worker. The study presents farmers' occupational diseases covered by KRUS. The structure and dynamics of incidence of diseases is examined. Territorial variation in the incidence of farmers' occupational diseases by voivodship is presented. The paper focuses on the assessment of health impairment due to occupational diseases of insured farmers. Prevention activities undertaken by KRUS to reduce the incidence of these diseases are also discussed.

Research hypotheses: (1) Lyme disease accounts for the largest share in the incidence of occupational infectious and parasitic diseases among farmers; (2) the largest incidence of occupational diseases is among farmers over 40 years of age.

Research methods: descriptive and tabular analysis and inference methods are used in the study.

Sources of information: data from KRUS on occupational diseases and their distribution structure by voivodship is used; literature sources and Statistics Poland (GUS) figures are also used.

Characteristics of Lyme disease as an occupational disease of farmers

Lyme disease for the first time emerged in Poland in 1966. At that time, 751 cases of the disease were reported. However, in recent years, the number of Lyme disease patients has exceeded 20,000¹. Lyme disease is an infectious disease caused by bacteria (Latin: *Borrelia burgdorferi*). There are many species of this bacterium. The vector of human infection is the tick, which parasitizes wild animals. By staying in tick habitats, humans become potential hosts. Infection occurs during a tick bite. Sometimes, the onset of the disease is asymptomatic. The bacterium may enter a state of latency. Then, despite the infection, no symptoms of the disease are observed. However, the latent state can turn into an active form of this disease at any time. The symptoms of Lyme disease include pains with malaise, joint and muscle pains,

1. P. Matuszek, *Zrozumieć diagnozę boreliozy*, Diagnostyka, nr 3(56), p. 24.

fever, fatigue and erythema. Antibody tests can only be performed approximately four to six weeks after a tick bite. The body takes some time to produce antibodies.

For many years, diagnosing Lyme disease used to be difficult and unreliable. Initially, there were no conclusive diagnostic methods. In view of this, the first valid methods for identifying the Lyme disease were developed in the USA in 1995. In Poland, it was only in 2007. The Society of Epidemiologists and Physicians of Infectious Diseases (Polish: *Towarzystwo Epidemiologów i Lekarzy Chorób Zakaźnych*, TEiLCHZ), recommended US methods for testing patients for Lyme disease². In line with the guidelines recommended by TEiLCHZ, the patient's clinical picture is the basis for the diagnosis of Lyme disease at the first stage of monitoring. If characteristic symptoms for the disease become evident, laboratory diagnostics should be performed next. Laboratory diagnosis of Lyme disease involves two serological tests in the IgM and IgG classes³. Once antibodies are detected, antibiotic therapy is required. It is worth noting that the presence of antibodies after antibiotic treatment does not mean that this treatment has failed⁴.

Farmers' occupational diseases

A farmers' occupational disease is considered to be one included in the list of occupational diseases annexed to the Regulation of the Council of Ministers of 18 November 1983⁵. Based on the above-mentioned list and occupational disease decisions issued by the State Sanitary Inspectorate, Table 1 shows the number of cases of occupational diseases among farmers in 2017–2021.

Table 1. Farmers' occupational diseases resulting in one-off compensation being granted between 2017 and 2021

No.	Disease entity or group	2017	2018	2019	2020	2021
1.	Acute or chronic intoxication or its sequelae induced by chemical substances	0	0	0	0	1
2.	Bronchial asthma	14	11	12	9	3
3.	Extrinsic allergic alveolitis	14	12	16	16	2

Continued on the next page.

2. Ibidem.

3. Ibidem, p. 25.

4. Ibidem, p. 26 and based on the authors' own experience.

5. Dz. U. 1983 nr 65 poz. 294.

Table 1. Farmers' occupational diseases resulting in one-off compensation being granted between 2017 and 2021 (cont.)

No.	Disease entity or group	2017	2018	2019	2020	2021
4.	Allergic rhinitis	4	1	3	2	0
5.	Skin conditions	2	5	4	3	2
6.	Chronic work-related musculoskeletal disorders	2	6	3	3	0
7.	Chronic work-related peripheral nervous system disorders	2	2	1	8	4
8.	Permanent bilateral cochlear hearing loss	0	1	1	1	0
9.	Physically, chemically and biologically induced diseases of the visual system	0	0	1	1	0
10.	Infectious or parasitic diseases or their sequelae, including:	253	299	296	190	197
	Lyme disease	232	282	282	185	189
	tick-borne encephalitis	16	14	12	5	8
	ocular toxoplasmosis	1	0	0	0	0
	toxocariasis	1	0	1	0	0
	liver echinococcosis	2	0	1	0	0
	tularemia	1	0	0	0	0
	listeriosis	0	1	0	0	0
	yersiniosis	0	1	0	0	0
	bartonellosis	0	1	0	0	0
	Total occupational diseases of farmers	293	337	337	233	209
	Number of patients with Lyme disease in Poland	21 512	20 158	20 629	2 934	12 410
	Share of farmers with Lyme disease in the total number of Lyme disease patients	1,07	1,40	1,37	1,43	1,52

Source: Figures by KRUS and the National Institute of Public Health – National Institute of Hygiene.

The figures in Table 1 suggest that infectious and parasitic diseases are predominant among farmers' occupational diseases. In 2017, their share was almost 86%. In turn, in 2021, the share of these diseases increased to 94%. Lyme disease accounts for the largest share in infectious and parasitic diseases. In 2017, it accounted for almost 92% of all infectious and parasitic diseases. Meanwhile, in 2021, its share among farmers increased to 96% of all infectious and parasitic diseases. However, the contribution of farmers to the overall incidence of Lyme disease in Poland is negligible. In 2017, it was 1.07%, rising to 1.52% in 2021. The small percentage of farmers developing Lyme disease, relative to the total number of cases in Poland,

is a positive development. The increase in the share of farmers with Lyme disease in the total number of patients suffering from Lyme disease is preoccupying. In absolute numbers, the incidence of Lyme disease among farmers is declining. In 2017, 232 cases of the disease were reported among those insured with KRUS, and in 2021, 189 cases. Other occupational diseases among farmers include bronchial asthma and allergic alveolitis. In 2017, these diseases represented less than 10% of the total occupational diseases of farmers. However, in 2021, the share of these diseases decreased and was just over 2%.

Table 2 shows health impairment suffered by farmers due to occupational diseases between 2012 and 2021.

Table 2. Incidence of occupational diseases from 2012 to 2021 based on health impairment determined

Incidence of diseases with health impairment	Year									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
up to 5%	80	109	109	104	159	154	190	19	122	111
6–10%	75	85	91	98	71	87	96	112	69	58
11–30%	38	36	47	41	36	49	44	46	41	37
31–60%	2	3	1	2	2	3	4	9	1	3
over 60%	2	1	2	0	0	0	3	1	0	0
Total:	198	234	250	245	268	293	337	337	233	209

Source: KRUS.

The figures in Table 2 suggest that farmers' occupational diseases are causing an ever decreasing impairment to their health. In 2012, farmers' occupational diseases that resulted in a low impairment to their health (up to 5%) accounted for just over 40%. By contrast, in 2021, these diseases causing the same impairment accounted for more than 53%. In 2012, occupational diseases that resulted in health impairment of 6% to 10% accounted for just over 38%. In 2021, the rate was almost 28%. As for the higher health impairment caused by farmers' occupational diseases (11–30%), in 2012, it was just under 20% and in 2021, over 17%. This trend is also positive. This indicates that farmers' occupational diseases between 2012 and 2021 are less and less harmful to the health of farmers insured with KRUS. This may possibly result from the prevention and rehabilitation measures implemented by KRUS, as well as the increasing foresight on the part of the farmers.

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The following table – Table 3 – shows the health effects created by farmers' occupational diseases. It shows the structure of health impairment caused by farmers' occupational diseases in 2021.

Table 3. Structure of health impairment for diseases/disease groups in 2021

% health impairment	Infectious or parasitic diseases or their sequelae	Chronic work-related musculoskeletal disorders	Skin conditions	Chronic irreversible respiratory system diseases	Acute or chronic intoxication or its sequelae induced by chemical substances	Total
up to 5%	108	2	1	0	0	111
6–10%	54	1	1	1	1	58
11–30%	33	1	0	3	0	37
31–60%	2	0	0	1	0	3
over 61%	0	0	0	0	0	0
Total	197	4	2	5	1	209

Source: KRUS.

The figures in Table 3 indicate that infectious and parasitic diseases are predominant among farmers' occupational diseases. In 53% of all cases of occupational diseases among farmers, they caused only up to 5% of health impairment. In 2021, there were almost 28% of farmers with up to 10% impairment. The same impairment due to infectious and parasitic diseases was suffered by 27% of farmers. In general, infectious and parasitic diseases do not result in major health impairment. In 2021, three farmers suffered a health impairment of 31–60%, two of them from infectious and parasitic diseases.

What is interesting is the assessment of the incidence of occupational diseases among farmers by voivodship. Relevant information is presented in Table 4.

Table 4. Farmers' occupational diseases per 100,000 insured in 2021

Voivodship	Incidence of occupational diseases per 100,000 insured
Zachodniopomorskie	8.6
Pomorskie	13.1
Warmińsko-Mazurskie	117.3
Lubuskie	87.8
Wielkopolskie	8.1
Kujawsko-Pomorskie	14.6

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Voivodship	Incidence of occupational diseases per 100,000 insured
Mazowieckie	16.4
Podlaskie	28.7
Dolnośląskie	76
Łódzkie	8.8
Lubelskie	17.1
Opolskie	4.0
Śląskie	25.2
Małopolskie	9.0
Podkarpackie	16.9
Świętokrzyskie	6.3

Source: Figures by KRUS.

The figures in Table 4 suggests that the highest incidence of occupational diseases among farmers was found in the Warmińsko-Mazurskie voivodship (117.3 per 100,000 insured), Lubuskie voivodship (87.8 per 100,000 insured) and Podlaskie voivodship (28.7 per 100,000 insured). By contrast, the lowest incidence was found in the following voivodships: Opolskie (4.0 per 100,000 insured), Świętokrzyskie (6.3 per 100,000 insured), and Dolnośląskie (7.6 per 100,000 insured). This incidence of occupational diseases by voivodship shows a positive correlation with the number of one-off compensation payments⁶.

Table 5 shows the effects of occupational diseases among farmers by age groups and sex in 2021.

Table 5. Age and sex of farmers with health impairment due to occupational diseases in 2021

Explanation a – number of persons affected b – % share in total incidence	Total	Incidence of occupational diseases by age groups								
		<18	18–19	20–29	30–39	40–49	50–59	60–64	85 and over	
Women	a	88,0	0	0	1	2	32	44	8	1
	b	42,1	0,0	0,0	0,5	1,0	15,3	21,0	3,8	0,5
Men	a	121,0	0	0	2	12	31	46	23	7
	b	57,9	0,0	0,0	1,0	5,7	14,8	22,0	11,0	3,3

Source: KRUS.

6. D. Walczak, *Ubezpieczenia społeczne w rolnictwie w roku 2009 i 2019 – zmiany ilościowe*, "Ubezpieczenia w Rolnictwie – Materiały i Studia" 2021, nr 1(75), p. 15.

The figures in Table 5 show that farmer's occupational diseases have a higher incidence among men. In 2021, the share of male farmers in terms of occupational disease incidence was almost 58%. Women farmers accounted for 42% in this structure by sex. The highest incidence is among farmers aged 40–59 years. This is the case for both men and women. In 2021, this age group accounted for 73% in the structure of the total incidence of occupational diseases among farmers. Farmers aged between 40 years and 65 years and over accounted for almost 92% of the total number of patients with occupational diseases in 2021. Farmers' occupational diseases are occasional in age groups up to 40 years. This is probably the result of greater professional foresight exhibited by younger farmers. The markedly higher incidence of occupational diseases among farmers over 40 years of age may be due to their poorer health and failure to follow occupational hygiene rules.

Prevention measures implemented by KRUS

Under the Act of 20 December 1990 on social insurance for farmers, KRUS is obliged to undertake prevention and rehabilitation activities⁷. Specifically, Article 63 of this Act defines the scope of these activities and the methods for their implementation. The measures by KRUS arising from this Article include:

- disseminating knowledge among the insured about the risks of agricultural accidents and occupational diseases and the principles of health and life protection;
- providing voluntary, free training and instruction to the insured on the principles of health and life protection on a farm;
- analysing the causes of accidents and occupational diseases;
- making efforts for the proper production and distribution of safe machinery, equipment and protective clothing for farmers.

Furthermore, Article 56 of the aforementioned Act provides for the possibility for KRUS to claim reimbursement of benefits paid to injured farmers from suppliers of products and services for agriculture, the defectiveness of which was the sole or main cause of an accident at agricultural work or an occupational disease. It is worth emphasising that the causes of accidents and occupational diseases reported to KRUS organisational units are analysed in order to determine the directions of

7. Dz. U. 2022 poz. 933.

the Fund's prevention activities. Based on these, in 2021, the President of KRUS recommended:

- 1) raising awareness on the principles of health and life protection on a farm;
- 2) acting to eliminate risks and prevent the most common accidents by:
 - improving the condition of surfaces in farmyards and access routes on farms;
 - using occupational protection measures;
 - using platforms and ladders with tipping and sliding protection when working at height;
 - eliminating doorsteps and recesses in buildings;
 - equipping plant and machinery with guards to protect against its moving parts;
 - safely coupling agricultural plant and machinery;
 - reading the operating instructions for plant and machinery used;
 - ensuring welfare and appropriate treatment of the animals;
 - taking care of the farmer's mental and physical condition;
- 3) contributing towards the proper production and distribution of agricultural inputs, equipment and clothing by:
 - informing farmers about products labelled with the KRUS Safety Seal and with the trade fair distinction awarded by the President of KRUS, entitled "Product which enhances farm work safety;"
 - conducting pre-emptive and recourse proceedings to eliminate from the market products that are structurally defective and which may be the cause of accidents or pose a risk to their users;
 - informing farmers about how to prevent occupational diseases – mainly about preventing tick bites and what to do if bitten.

The prevention activities of KRUS take a variety of forms. These include, i.a., training courses, competitions, information and prevention stands, demonstrations of safe working practices and the use of personal protective equipment. KRUS also conducts farm visits to identify risks. In addition, the principles of safe farm work are popularised through mass media and information material.

Summary

The aim of the study was to assess the generic, quantitative and territorial structure of occupational diseases among farmers between 2012 and 2021. The prevention activities of KRUS were also presented. The first part of the paper presents Lyme disease as the main occupational disease of farmers. Infectious and parasitic diseases are predominant among farmers' occupational diseases. In 2021, the share of these diseases in the structure of total occupational diseases amounted to 94%. In 2021, Lyme disease accounted for 96% of all infectious and parasitic diseases. Thus, hypothesis one⁸ has been verified positively. However, as far as the proportion of farmers with Lyme disease in Poland is concerned, it is negligible (about 1.5%). Farmers' occupational diseases do not lead to major health impairment. In 2021, 53% of farmers with occupational diseases suffered a minor health impairment (up to 5%). By contrast, 81% of affected farmers suffered an impairment of up to 10% due to occupational diseases. The highest incidence of occupational diseases among farmers was found in the Warmińsko-Mazurskie, Lubuskie and Podlaskie voivodships. The lowest number of such diseases was recorded in the Opolskie, Świętokrzyskie and Dolnośląskie voivodships. Occupational diseases have a higher incidence among men than among women. In 2021, the share of men farmers affected with occupational diseases was 58%. The highest number of farmers suffering from occupational diseases can be found those in the age group of 40–65 years and over. In 2021, these age groups accounted for 92% of the total number of farmers affected with occupational diseases. This demonstrates that hypothesis two has also been verified positively⁹.

Particularly noteworthy are the various prevention activities undertaken by KRUS. These involve, i.a., rewarding manufacturers of safe plant and machinery used by farmers. KRUS provides training as well as courses and promotes safe work on a farm.

8. Hypothesis 1: Lyme disease accounts for the largest share in the incidence of occupational infectious and parasitic diseases.

9. Hypothesis 2: The highest number of farmers suffering from occupational diseases can be found among those aged 40–65 years and older.

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